

Serial No.: 10/553,860

Examiner: David J. Goodwin

Title: FIELD EFFECT TRANSISTOR, ELECTRICAL ELEMENT ARRAY, AND MANUFACTURING METHOD FOR THE SAME

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listing, of claims in the application.

1-6. (Canceled)

7. (Currently amended) An electrical element array, comprising:
- a substrate; and
 - a n-type field effect transistor and a p-type field effect transistor that are formed on the substrate,
- wherein the n-type field effect transistor, comprising:
- a gate electrode formed on the substrate;
 - a gate insulation layer formed on the gate electrode;
 - a source electrode and a drain electrode that are formed on the gate insulation layer;
 - a n-type semiconductor layer comprising carbon nanotube, formed between the source electrode and the drain electrode so as to contact with the source electrode and the drain electrode; and
 - a n-type modifying polymer layer formed on the n-type semiconductor layer, the n-type modifying polymer layer being for converting a polarity of the carbon nanotube from an original polarity of p-type into n-type and for stabilizing the polarity,
- wherein the p-type field effect transistor, comprising:
- a gate electrode formed on the substrate;
 - a gate insulation layer formed on the gate electrode;
 - a source electrode and a drain electrode that are formed on the gate insulation layer; and
 - a p-type semiconductor layer comprising carbon nanotube, formed between the source electrode and the drain electrode so as to contact with the source electrode and the drain electrode,

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wherein the carbon nanotube of the n-type semiconductor layer and the carbon nanotube of the p-type semiconductor layer are formed in the same step and of the same materials.

8. (Currently amended) The field effect transistor according to claim 7, wherein the n-type modifying polymer is a polymer containing an imine nitrogen-containing polymer.

9. (Currently amended) The field effect transistor according to claim 8, wherein the polymer containing imine nitrogen containing polymer is polyalkylene imine.

10. (Original) The field effect transistor according to claim 9, wherein the polyalkylene imine is at least one selected from the group consisting of polyethylene imine, polypropylene imine and polybutylene imine.

11. (Original) The field effect transistor according to claim 7, further comprising a resin protective film formed on the n-type modifying polymer layer.

12. (Original) The field effect transistor according to claim 7, wherein the n-type modifying polymer is formed by an ink-jet method.

13. (Currently amended) The electrical element array according to claim 7, further comprising a protective layer made of an imine nitrogen not containing a polymer not containing imine nitrogen formed on the p-type semiconductor layer.

14. (Currently amended) The electrical element array according to claim 13, wherein the polymer not containing imine nitrogen not containing polymer is at least one selected from the group consisting of an acrylic resin, an epoxy resin, polyolefin, polyester, polycarbonate, polystyrene, polyacrylonitrile, polyvinylidene fluoride, polyvinylidene cyanide and polyvinyl alcohol.

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15. (Canceled)

16. (Currently amended) A method for manufacturing a field effect transistor, comprising the steps of:

- forming a gate electrode on a substrate;
- forming a gate insulation layer on the gate electrode;
- forming a source electrode and a drain electrode on the gate insulation layer;
- forming a p-type semiconductor layer comprising carbon nanotube on the gate insulation layer and between the source electrode and the drain electrode; and
- forming a n-type modifying polymer layer on the p-type semiconductor layer by dispensing with an ink-jet method, the n-type modifying polymer layer being for converting a polarity of the carbon nanotube from an original polarity of p-type into n-type and for stabilizing the polarity, whereby the p-type semiconductor layer is converted into a n-type semiconductor layer.

17. (Currently amended) The method for manufacturing a field effect transistor according to claim 16, wherein the n-type modifying polymer is a polymer containing an imine nitrogen-containing polymer.

18. (Currently amended) The method for manufacturing a field effect transistor according to claim 17, wherein the polymer containing imine nitrogen-containing polymer is polyalkylene imine.

19. (Original) The method for manufacturing a field effect transistor according to claim 18, wherein the polyalkylene imine is at least one selected from the group consisting of polyethylene imine, polypropylene imine and polybutylene imine.

20. (Currently amended) A method for manufacturing an electrical element array

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including a n-type field effect transistor and a p-type field effect transistor on a substrate, comprising the steps of:

- forming a gate electrode on a substrate;
- forming a gate insulation layer on the gate electrode;
- forming a source electrode and a drain electrode on the gate insulation layer;
- forming a p-type semiconductor layer comprising carbon nanotube on the gate insulation layer and between the source electrode and the drain electrode; and
- forming a n-type modifying polymer layer only on a part of the p-type semiconductor layer that should be converted into n-type by dispensing in an ink-jet method, the n-type modifying polymer layer being for converting a polarity of the carbon nanotube from an original polarity of p-type into n-type and for stabilizing the polarity, whereby only the part of the p-type semiconductor layer that should be converted into n-type is converted into a n-type semiconductor layer.